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10/731,268

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EXAMINER

WEINER, LAURA S

ART UNIT

PAPER NUMBER

1745

MAIL DATE

DELIVERY MODE

09/27/2007

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

| | | | |
|------------------------------|-------------------------------|-----------------------------|--|
| Office Action Summary | Application No. 10/731,268 | Applicant(s) SUN, LUYING | |
| | Examiner Laura S. Weiner | Art Unit 1745 | |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 13 August 2007.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 8-16 and 22-33 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 8-16, 22-33 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Response to Arguments

1. Applicant's arguments with respect to claims 8-16, 29-33; 22-28 have been considered but are moot in view of the new ground(s) of rejection.

Claim Rejections - 35 USC § 102

Claim Rejections - 35 USC § 103

2. Claims 8-16, 30-33 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Nishikawa et al. (JP 2000-113906, translation).

Nishikawa et al. teaches an electrolyte solution comprising EC and Formula (V), $R1'-COO-(CH_2)_a-CN$ where R1 can be an alkyl group [teaching Formula (Ib)].

Nishikawa et al. teaches on page 3, [0013] of translation, that selecting the amount of polar solvent besides the above, and/or a cyano ethyl ether system quantity dielectric constant solvent in 5-95% by weight of the range among electrolytic solution solvent total amounts. Nishikawa et al. teaches on page 4 of translation, that the electrolyte salt was LiPF₆.

Since Nishikawa et al. teaches the same electrolyte comprising a cyclic carbonate, a nitrile compound and a LiPF₆ salt then inherently the same electrolyte having an ionic conductivity of greater than 9×10^{-3} S/cm at about 25 degrees C having an ionic conductivity of greater than 1×10^{-3} S/cm at about -30 degrees C, having an ionic conductivity of greater than 3×10^{-4} S/cm at about -50 degrees C, the weight loss

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of the electrolyte is less than 3% after heated at 90 degrees C for 2 hours, the weight loss of the electrolyte is less than 5% after heated at 90 degrees C for 4 hours, the freezing point of the electrolyte is less than -60 degrees C and the boiling point of the nitrile higher than 120 degrees C and flash point is higher than 60 degrees C must also be obtained.

In addition, the presently claimed property of having an ionic conductivity of greater than 9×10^{-3} S/cm at about 25 degrees C having an ionic conductivity of greater than 1×10^{-3} S/cm at about -30 degrees C, having an ionic conductivity of greater than 3×10^{-4} S/cm at about -50 degrees C, the weight loss of the electrolyte is less than 3% after heated at 90 degrees C for 2 hours, the weight loss of the electrolyte is less than 5% after heated at 90 degrees C for 4 hours, the freezing point of the electrolyte is less than -60 degrees C and the boiling point of the nitrile higher than 120 degrees C and flash point is higher than 60 degrees would have obviously have been present once the Nishikawa et al. product is provided. *In re Best*, 195 USPQ 433 (CCPA 1977).

3. Claims 8-16, 30-33; 22, 24-28 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Tabuchi et al. (JP 2000-067913, translation).

Tabuchi et al. teaches on page 3, [0018] in example 2, an electrolyte comprising 50:50 of EC:EMC and the total electrolyte comprises 70 vol% carbonates and 30 vol% methyl-2-cyano ethyl ether [teaching Formula (1d)] and LiPF₆. Tabuchi et al. teaches on pages 2-3, [0016], that the battery comprises the electrolyte, a positive

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electrode comprising lithium cobalt multiple oxide, a separator comprising polyethylene and a negative electrode comprising graphite.

Since Tabuchi et al. teaches the same electrolyte comprising a cyclic carbonate, a nitrile compound and a LiPF₆ salt then inherently the same electrolyte having an ionic conductivity of greater than 9×10^{-3} S/cm at about 25 degrees C having an ionic conductivity of greater than 1×10^{-3} S/cm at about -30 degrees C, having an ionic conductivity of greater than 3×10^{-4} S/cm at about -50 degrees C, the weight loss of the electrolyte is less than 3% after heated at 90 degrees C for 2 hours, the weight loss of the electrolyte is less than 5% after heated at 90 degrees C for 4 hours, the freezing point of the electrolyte is less than -60 degrees C and the boiling point of the nitrile higher than 120 degrees C and flash point is higher than 60 degrees C must also be obtained.

In addition, the presently claimed property of having an ionic conductivity of greater than 9×10^{-3} S/cm at about 25 degrees C having an ionic conductivity of greater than 1×10^{-3} S/cm at about -30 degrees C, having an ionic conductivity of greater than 3×10^{-4} S/cm at about -50 degrees C, the weight loss of the electrolyte is less than 3% after heated at 90 degrees C for 2 hours, the weight loss of the electrolyte is less than 5% after heated at 90 degrees C for 4 hours, the freezing point of the electrolyte is less than -60 degrees C and the boiling point of the nitrile higher than 120 degrees C and flash point is higher than 60 degrees would have obviously have been present once the Tabuchi et al. product is provided. *In re Best*, 195 USPQ 433 (CCPA 1977).

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4. Claims 8-16, 30-33; 22, 24-28 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Hayashi et al. (JP 2000-164,249, translation).

Hayashi et al. teaches a battery comprising a negative electrode comprising a carbon material, a positive electrode comprising a multiple oxide of a lithium and transition metals and an electrolyte comprising CN-CH₂CH₂OX, an annular carbonate and/or a chain carbonate and a salt comprising LiPF₆, LiBF₄, etc. Hayashi et al. teaches on page 6, Example 1, an electrolyte comprising LiPF₆ dissolved into cyano ethyl ether fluorine: EC: DMC in a weight ratio of 60:20:20.

Since Hayashi et al. teaches the same electrolyte comprising a cyclic carbonate, a nitrile compound and a LiPF₆ salt then inherently the same electrolyte having an ionic conductivity of greater than 9×10^{-3} S/cm at about 25 degrees C having an ionic conductivity of greater than 1×10^{-3} S/cm at about -30 degrees C, having an ionic conductivity of greater than 3×10^{-4} S/cm at about -50 degrees C, the weight loss of the electrolyte is less than 3% after heated at 90 degrees C for 2 hours, the weight loss of the electrolyte is less than 5% after heated at 90 degrees C for 4 hours, the freezing point of the electrolyte is less than -60 degrees C and the boiling point of the nitrile higher than 120 degrees C and flash point is higher than 60 degrees C must also be obtained.

In addition, the presently claimed property of having an ionic conductivity of greater than 9×10^{-3} S/cm at about 25 degrees C having an ionic conductivity of greater than 1×10^{-3} S/cm at about -30 degrees C, having an ionic conductivity of greater than

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3X10⁻⁴ S/cm at about -50 degrees C, the weight loss of the electrolyte is less than 3% after heated at 90 degrees C for 2 hours, the weight loss of the electrolyte is less than 5% after heated at 90 degrees C for 4 hours, the freezing point of the electrolyte is less than -60 degrees C and the boiling point of the nitrile higher than 120 degrees C and flash point is higher than 60 degrees would have obviously have been present once the Hayashi et al. product is provided. *In re Best*, 195 USPQ 433 (CCPA 1977).

Claim Rejections - 35 USC § 103

5. Claims 23 and 29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hayashi et al. (JP 2000-164,249, translation).

Hayashi et al. teaches a battery comprising a negative electrode comprising a carbon material, a positive electrode comprising a multiple oxide of a lithium and transition metals and an electrolyte comprising CN-CH₂CH₂OX, an annular carbonate and/or a chain carbonate and a salt comprising LiPF₆, LiBF₄, etc. Hayashi et al. teaches on page 6, Example 1, an electrolyte comprising LiPF₆ dissolved into cyano ethyl ether fluorine: EC: DMC in a weight ratio of 60:20:20.

Hayashi et al. teaches the claimed invention except does not specifically teach that the electrolyte salt comprising a mixture of 50:50 LiPF₆ and LiBF₄.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to use both salts, LiPF₆ and LiBF₄ in the electrolyte taught by Hayashi et al. because it is prima facie obvious to combine two compositions each of

which is taught by prior art to be useful for the same purpose in order to form a third composition that is to be used for the very same purpose. See *In re Kerkhoven*, 205 USPQ 1069; *In re Susi*, 169 USPQ 423.

Claim Rejections - 35 USC § 112

6. Claims 8-16, 29-33; 22-28 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 8 is rejected because the formula $-(CH_2)_y-OR_8$ should instead be $-(CH_2)-OR_8$ because y can only stand for 1.

Claim 22 is rejected because in (a) it is unclear what is meant by "at least a separator". Also since the positive electrode and negative electrode has been discussed the claim should cited "between the positive electrode and the negative electrode". Also, in (c) the discussion of the salt, first solvent and second solvent is redundant because it is already discussed in the beginning of the claim.

Conclusion

7. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

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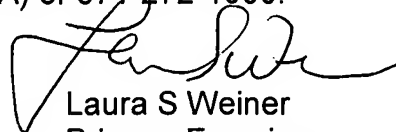
A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Laura S. Weiner whose telephone number is 571-272-1294. The examiner can normally be reached on M-F (6:30-4:00).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick Ryan can be reached on 571-272-1292. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.



Laura S Weiner
Primary Examiner
Art Unit 1745

September 24, 2007